OPERATING SYSTEM

Introduction to OS

Lets understand OS from a real life example -> Imagine an example of a restaurant
Now the restraunt has waiter, customers and restraunt manager

- Customer (User) orders food → Requests a task (e.g., opening an app).
- Waiter (OS) takes the order → Acts as an intermediary.
- Waiter delivers the order to the kitchen (CPU) → Sends the request for processing.
- Chef (CPU) prepares the food → Executes the task.
- Waiter serves the food to the customer → Returns the processed output.
- Waiter manages multiple customers efficiently → Handles multitasking and resource allocation.

The waiter (OS) acts as a middleman between the customer (user) and the kitchen (CPU), ensuring smooth communication and efficient service

An **Operating System (OS)** is like the waiter of a restaurant that ensures everything runs smoothly between customers, chefs, and manager.

OPERATING SYSTEM

Introduction to OS

What is an Operating system?

An **Operating System (OS)** is the fundamental software that manages hardware and software resources on a computer. It acts as an intermediary between users and the computer hardware, ensuring that all applications run smoothly and that resources like CPU, memory, and storage are allocated efficiently.

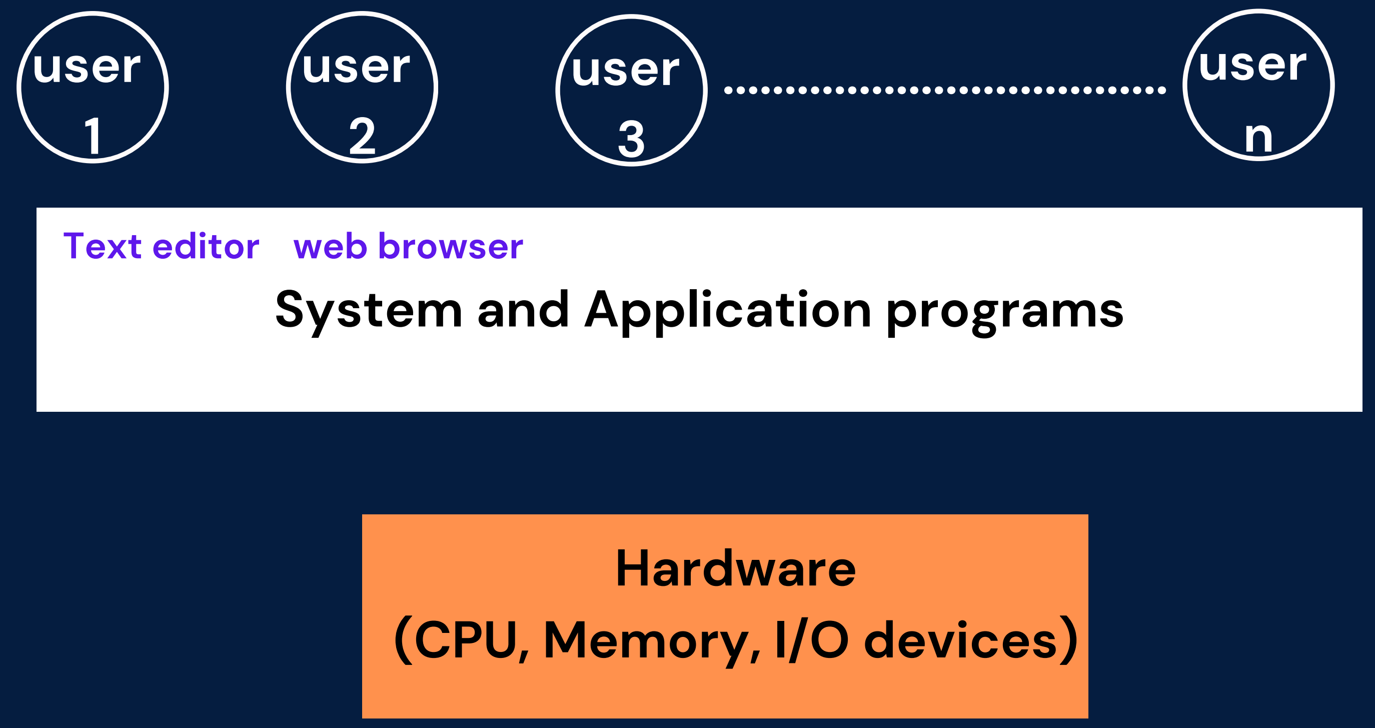
It provides an environment where applications can run and users can interact with the computer.

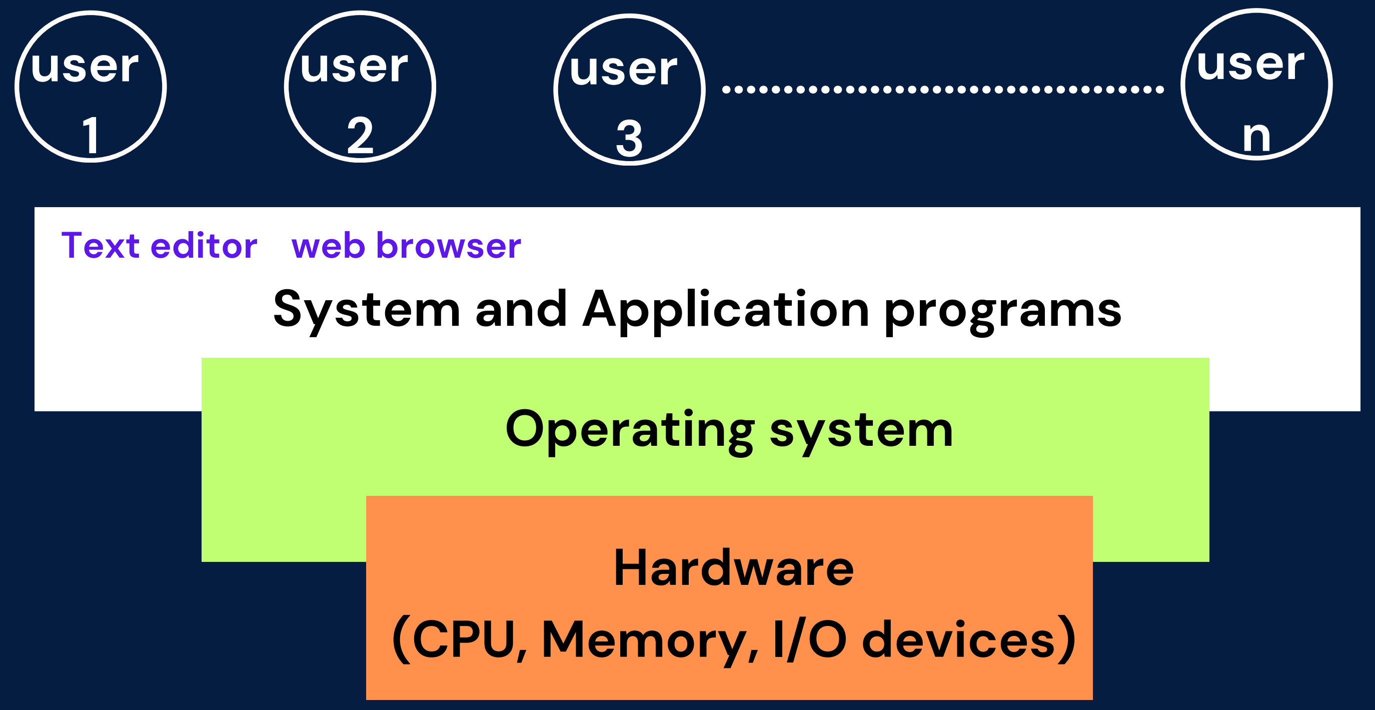
Example of OS : Windows, Android and iOS, Linux, macOS

Scenario where OS is used : When a user clicks "Save" in a word processor, the application issues a system call to the OS to write data to the hard drive

OPERATING SYSTEM

Introduction to OS





- Users must control hardware manually, (programming)
- Only dedicated programs can run, no multitasking
- For any small task user needs to interact to hardware directly using coding like loading, saving etc
- It can also lead to improper resource and memory utilisation as you have to tell the hardware explicility to allocate memory

- Provides a GUI to interact with applications and files easily.
- Allows running multiple applications
- Manages CPU, memory, and storage to optimize performance

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Introduction to OS

System software : It help to manage and operate the computer hardware so that other software can function.
Ex : Compiler (Convert high-level code to machine language), Operating Systems (OS) , Utility Software(Antivirus software which perform specific tasks related to system maintenance and optimization)

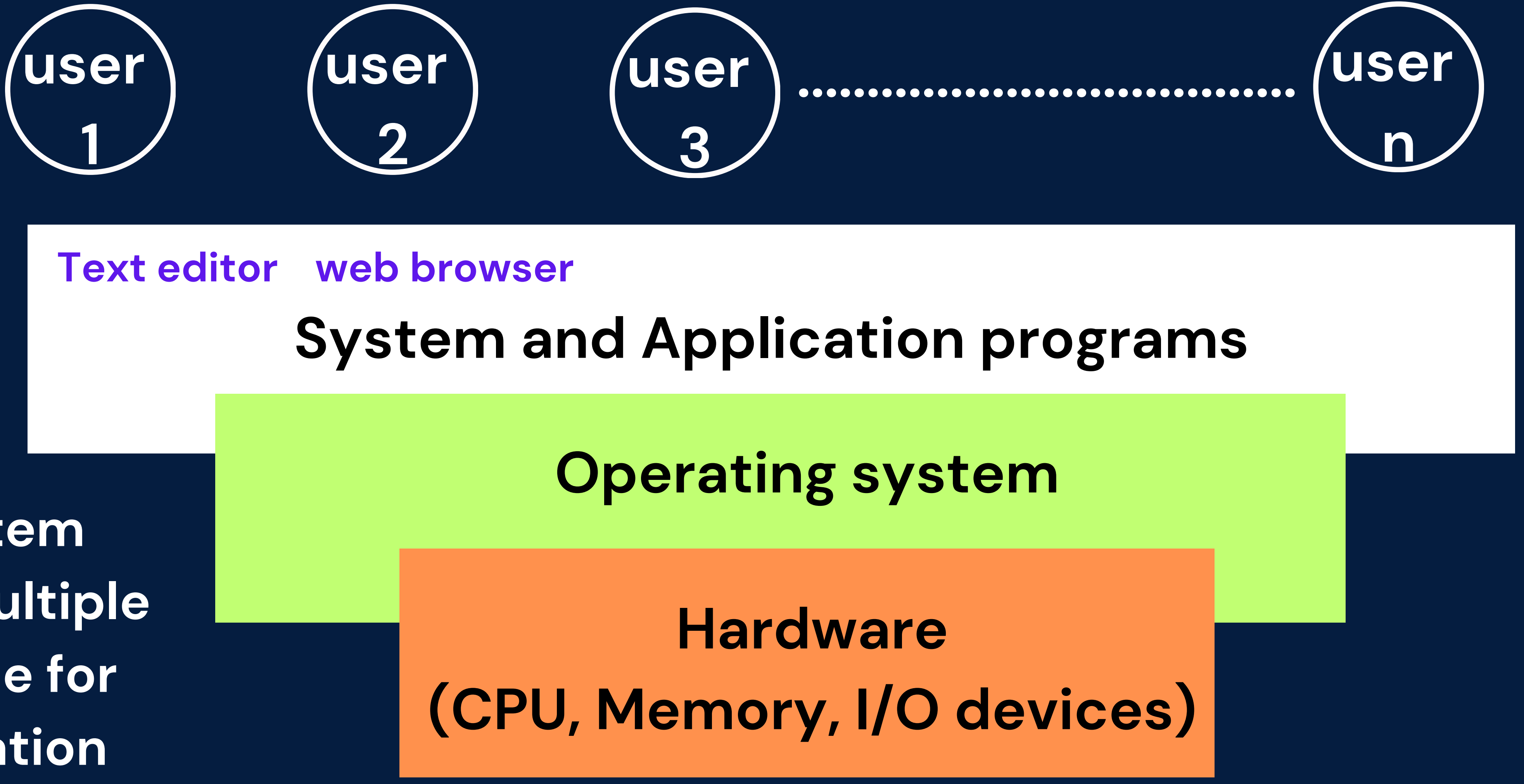
Application software : It is designed to perform specific tasks for users. It runs on top of the system software and interacts with it to carry out its functions.
Ex : Word Processor(Used for writing and editing documents.)

-> **System software** is essential for the computer to function, while **application software** provides tools for specific tasks.

-> **System software** typically comes pre-installed with the computer, while **application software** is usually installed separately.

OPERATING SYSTEM

Relationship between a computer's hardware components, its operating system and the application packages



User interacts with the web apps/browser

Application requests for some hardware resource to OS

Operating system interacts with multiple hardware device for resource allocation

OPERATING SYSTEM

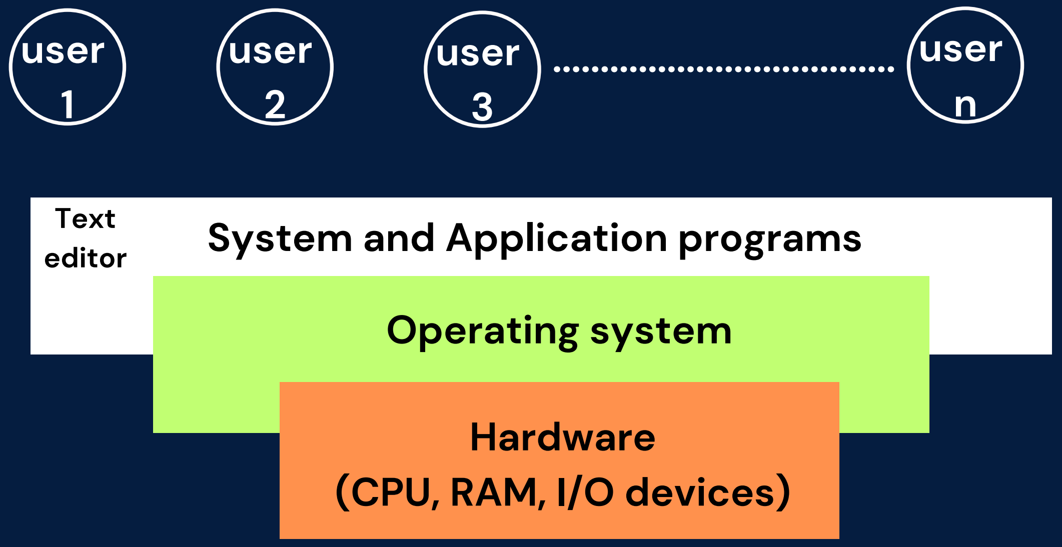
Let’s understand OS from an example of “Saving a Document”

- User Interaction: The user interacts with the application (Text editor) and requests to save the document.

- Application-OS Interaction: The application sends a system call to the operating system to request writing the document to the storage device

- OS-Hardware Interaction: The OS communicates with the hardware through the file system and storage device drivers to physically write the data to the storage medium.

- Hardware: The hardware performs the actual writing of data to the disk.


user 1
user 2
user 3
user n
Text editor
System and Application programs
Operating system
Hardware
(CPU, RAM, I/O devices)